

State of California  
**Department of Health Services**

December 20, 2002

CHDP Provider Information Notice No.: 02-10

TO: ALL CHILD HEALTH AND DISABILITY PREVENTION (CHDP)  
PROGRAM PROVIDERS

SUBJECT: RECOMMENDATIONS FOR VISION SCREENING

The purpose of this notice is to provide you with information about the importance of completing a red reflex examination in all newborns. Attached is a copy of the American Academy of Pediatrics (AAP) policy on "Red Reflex Examination in Infants" issued in May 2002.

The Vision Screening guidelines (Section 601) in the CHDP Health Assessment Guidelines have been revised to reference the AAP policy. The updated guidelines also clarify the recommendation for the use of a standardized chart, such as the Snellen or equivalent, to test visual acuity starting at three years of age. Please update your copy of the Health Assessment Guidelines with the enclosed replacement pages.

If you have any questions, please contact your local CHDP Program.

**Original Signed by Maridee Gregory, M.D.**

Maridee A. Gregory, M.D., Chief  
Children's Medical Services Branch

Enclosures



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Children's Medical Services Branch  
714/744 P Street, P.O. Box 942732, Sacramento, CA 94234-7320  
(916) 327-1400

Internet Address: <http://www.dhs.ca.gov/pcfh/cms>

## **VISION SCREENING**

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### **SCREENING REQUIREMENTS**

Screen for visual problems at each health assessment visit. See Table 601.1

Include in the Vision Screening:

- Patient and family history of visual difficulties or ocular pathology, such as tumors or cataracts.
- Inspection of the external eye.
- Ophthalmoscopic visualization of the lens (red reflex) and fundoscopic examination.
- Pupillary reaction to light and accommodation.
- Cover-uncover test.
- Hirschberg's test (corneal light reflex).

Test for visual acuity using a standardized chart, such as the Snellen or equivalent, at each health assessment visit starting at age three years.

### **CONSIDERATIONS FOR REFERRAL, TREATMENT, AND/OR FOLLOW-UP**

Treat or refer any eye conditions to a medical specialist.

Refer any of the following conditions to an ophthalmologist or optometrist:

- A possible vision problem according to history or clinical observation.
- Any abnormalities as observed by the corneal light reflex test, cover test, or ophthalmoscopic exam.
- A visual acuity of 20/50 or poorer in either eye using a standardized chart, such as the Snellen or equivalent, for children age three through five years.
- A two line difference in visual acuity between the eyes on a standardized chart, such as the Snellen or equivalent.
- A visual acuity of 20/40 or poorer in either eye using a standardized chart, such as the Snellen or equivalent, for children age six years and older.
- All children who are not testable because of special medical problems or who are developmentally delayed.

## RATIONALE

Early detection of strabismus and prevention of amblyopia is of primary importance. Refractive errors are the most common ophthalmologic disorders in children. These errors occur in approximately 20 percent of children by age 16 years. Strabismus occurs in two percent of children and is one of the primary causes of amblyopia or "lazy eye." While the risk of amblyopia is greatest for children during their first three years of life, the potential exists until children complete their visual development at approximately age nine years. Left untreated, amblyopia may lead to irreversible visual deficits. Other potential ophthalmologic disorders during infancy and childhood include cataracts (1/20,000 live births) and retinopathy of prematurity.

## BASICS OF VISION SCREENING PROCEDURES

Examine the red reflex in a darkened room by holding an ophthalmoscope or other light source at a distance of about 12 inches. Look through the ophthalmoscope at each of the child's eyes. Both retinal reflexes should be red or red-orange and of equal intensity.

Conduct the corneal light reflex test in a darkened room by holding the ophthalmoscope or other light source about two feet away from the child's eyes. The corneal light reflections should fall at corresponding points of the child's eyes. If the light reflections fall asymmetrically the eyes are improperly aligned, or strabismic.

Perform the cover-uncover test with children age three years and older. Have the child focus on a stationary object. Then place a hand or cover in front of one eye and observe the other eye. Quickly remove the cover and observe for uncontrolled eye movement in the just uncovered eye. The eye should remain motionless. Repeat the exam with the other eye.

Perform the visual acuity test correctly, using a standardized chart, with children age three years and older. The Snellen E is recommended for children age three to six years and the Snellen Letters are recommended for children over age six years. The distance from the chart to the child can be either 10 feet or 20 feet, depending on whether the screening chart is for the 10 foot or 20 foot distance. Keep the room free of distractions and the eye chart at eye level and illuminated to 10 to 30 foot candles. Measure either the 10 foot or 20 foot distance from the vision screening chart and draw a line indicating where the child should stand (with heels on the line) or sit (with back of chair above line). Screen each eye separately and be sure the child cannot see around the occluder. Record the line where the child accurately sees one more than one-half of the characters.

It is recommended that the highest cognitive level chart be used for the child. In addition to the Snellen test, there are other tests that can be used. These tests may be useful in testing the vision of children who would otherwise be untestable. The validity and reliability of results, however, may not be as good as with the Snellen E. These tests are The HOTV or Matching Symbol Test, the Lea Symbol Chart, the Faye Symbol Chart, or the Allen Picture Card Test.

**Table 601.1 EYE AND VISION SCREENING  
RECOMMENDATIONS FOR PRIMARY CARE PROVIDERS**

<b>Age</b>	<b>Screening Method</b>	<b>Indicators Requiring Further Evaluation</b>
<b>Newborn to 2 months</b>	Red reflex*	Abnormal or asymmetric
	Corneal light reflex	Asymmetric
	Inspection	Structural abnormality
<b>2 months to 3 years</b>	Red reflex	Abnormal or asymmetric
	Corneal light reflex	Asymmetric
	Fundoscopic exam	Any abnormality
	Fix and follow with each eye	Failure to fix and follow
	Inspection	Structural abnormality
<b>3 years through 5 years</b>	Visual acuity	20/50 or worse in either eye or 2 line difference between eyes
	Red reflex	Abnormal or asymmetric
	Corneal light reflex	Asymmetric
	Cover-uncover test	Ocular refixation movements
	Fundoscopic exam	Any abnormality
	Inspection	Structural abnormality
<b>6 years and older</b>	Visual acuity	20/40 or worse in either eye
	Red reflex	Abnormal or asymmetric
	Corneal light reflex	Asymmetric
	Cover-uncover test	Ocular refixation movements
	Fundoscopic exam	Any abnormality
	Inspection	Structural abnormality

\* Refer to American Academy of Pediatrics (AAP) policy statement on Red Reflex Examination in Infants (available in Pediatrics, 109(5), May 2002 or at [www.aap.org/policy/060012.html](http://www.aap.org/policy/060012.html))



## **Red Reflex Examination in Infants**

### **AMERICAN ACADEMY OF PEDIATRICS**

#### **Policy Statement**

Organizational Principles to Guide and Define the Child Health Care System and/or Improve the Health of All Children

#### **Section on Ophthalmology**

**ABSTRACT.** Red reflex examination is recommended for all infants. This statement describes the indications for and the technique to perform this examination, including indications for dilation of the pupils before examination and indications for referral to an ophthalmologist.

#### **INTRODUCTION**

Current American Academy of Pediatrics policy recommends eye examinations for infants and children at specified intervals during their development, including an examination to take place sometime during the first 2 years of life, stating: "Vision screening and eye examination are vital for the detection of conditions that distort or suppress the normal visual image, which may lead to inadequate school performance or, at worst, blindness in children. Retinal abnormalities, cataracts, glaucoma, retinoblastoma, eye muscle imbalances, and systemic disease with ocular manifestations may all be identified by careful examination."<sup>1</sup>

The policy further recommends that an eye evaluation for infants and children from birth to 2 years of age include examination of the following:

1. Eyelids and orbits;
2. External structures of the eyes;
3. Motility;
4. Eye muscle balance;
5. Pupils; and
6. Red reflex.

The red reflex test is used to screen for abnormalities of the back of the eye (posterior segment) and opacities in the visual axis, such as a cataract or corneal opacity. An ophthalmoscope held close to the examiner's eye and focused on the pupil is used to view the eyes from 12 to 18 inches away from the subject's eyes. To be considered normal, the red reflex of the 2 eyes should be symmetrical. Dark spots in the red reflex, a blunted red reflex on 1 side, lack of a red reflex, or the presence of a white reflex (retinal reflection) are all indications for referral to an ophthalmologist.

Concern has been expressed recently that diagnosis of serious ocular conditions, including retinoblastoma and congenital cataract, in which early treatment is essential for future ocular and systemic health, often is not made sufficiently early to minimize potential consequences of those conditions. This concern has led to consideration of legislation in several states<sup>a</sup> mandating early pupil-dilated red reflex examinations in all neonates or very young infants.

Although in infants, pupils are easily dilated using various agents, significant complications have been sporadically reported with all commercially available dilating agents, including sympathomimetic agents like phenylephrine and anticholinergic agents like cyclopentolate hydrochloride and tropicamide. These complications include elevated blood pressure and heart rate,<sup>2</sup> urticaria,<sup>3</sup> cardiac arrhythmias,<sup>4</sup> and contact dermatitis.<sup>5,6</sup> However, pupillary dilation has been performed routinely for many years in almost all new patients seen in most pediatric ophthalmology offices, with no complications seen for years at a time, so this procedure appears to be very safe when performed in an office setting on infants older than 2 weeks. Similarly, premature infants' pupils are often dilated in the neonatal intensive care unit without significant complication, so dilation appears to be relatively safe even in very young infants.

The purpose of this policy statement is to suggest a guideline based on current knowledge and experience for examination of the eyes of young infants to minimize the risk of delay in diagnosis of serious vision-threatening or life-threatening disorders.

## RECOMMENDATIONS

1. All infants should have an examination of the red reflex of the eyes performed during the first 2 months of life by a pediatrician or other primary care clinician trained in this examination technique. This examination should be performed in a darkened room on an infant with his or her eyes open, preferably voluntarily, using a direct ophthalmoscope held close to the examiner's eye and approximately an arm's length from the infant's eyes.
2. The result of a red reflex examination is to be rated as negative or normal when the reflections of the 2 eyes are equivalent in color, intensity, and clarity and there are no opacities or white spots (leukokoria) within the area of either or both red reflexes.
3. A positive or abnormal result of a red reflex examination (inequality in color, intensity or clarity of the reflection, or the presence of opacities or white spots) should be followed, in a timely fashion, by 1 of 2 actions:
  - a. A red reflex examination preceded by pupil dilation with  $\leq 1\%$  tropicamide or a  $\leq 1\%$  tropicamide/2.5% phenylephrine mixture or a 0.25% cyclopentolate/2.5% phenylephrine (eyedrop or spray), administered to each eye approximately 15 minutes before this examination.
  - b. Examination by an ophthalmologist experienced in the examination and treatment of the eyes of young infants, including ocular fundus examination, using indirect ophthalmoscopy after pupil dilation.
4. Infants in high-risk categories, including relatives of patients with retinoblastoma, congenital cataract, congenital retinal dysplasia, and other congenital retinal and lenticular disorders should initially have a dilated red reflex examination or examination by an ophthalmologist experienced in the examination and treatment of the eyes of young infants, as described previously (3b).
5. Infants with a history of leukokoria (a white pupillary reflex) in 1 or both eyes noted by parents or other observers or on any physical examination, and those with absence of a red reflex should have an examination by an ophthalmologist experienced in the examination and treatment of the eyes of young infants, as described previously (3b).

## RED REFLEX SUBCOMMITTEE

\*Walter M. Fierston, MD, Chairperson  
Allan M. Eisenbaum, MD  
Howard L. Freedman, MD  
Harold P. Koller, MD

SECTION ON OPHTHALMOLOGY, 2001-2002

Gary T. Denslow, MD, MPH, Chairperson  
Steven J. Lichtenstein, MD, Chairperson-Elect  
Jay Bernstein, MD  
Edward G. Buckley, MD  
George S. Ellis, Jr, MD  
Gregg T. Lueder, MD  
James B. Ruben, MD

CONSULTANT

Michael Redmond, MD

STAFF

Stephanie M. Mucha, MPH

\*Lead author

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<sup>a</sup>Passed in California and under consideration in New York, Massachusetts, South Carolina, Florida, and New Jersey (at the time of publication).

The recommendations in this statement do not indicate an exclusive course of treatment or serve as a standard of medical care. Variations, taking into account individual circumstances, may be appropriate.

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